# Oracle SOA Suite 11g Oracle SOA Suite 11g HL7 Inbound Customized HL7 Message Structure and Data Validation

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#### Introduction

Messages we used in previous articles dealing with HL7 Inbound were not strictly speaking valid, according to the default HL7 V2 ADT A01 message specification produced by the Oracle B2b Document Editor. Both the message structure was not quite right and the data was not quite right. To allow such messages in, we disabled Validation property in the B2B Trading Partnership Agreement.

In this article we will create a customized HL7 v2 ADT A01 structure which will allow us to successfully validate incoming messages. We will then modify the document definition and Partnership Agreements to use this custom structure and validate messages as they come in.

The customization we will discuss here only scratches the surface of what is possible with the Oracle B2B Document Editor.

#### **Pre-requisites**

It is assumed that a Windows XP SP3 platform with the Oracle SOA Suite 11g, installed and configured as discussed in "Installing Oracle SOA Suite for HL7 Exploration", published at <u>http://blogs.czapski.id.au/wp-content/uploads/2010/06/01\_Installing\_Oracle\_SOA\_Suite\_for\_HL7\_exploration\_v1.</u> 1.pdf, is available and will be used for the work discussed in this article.

It is assumed that the HL7 solutions, discussed in blog articles <u>Oracle SOA Suite 11g</u> <u>HL7 Inbound Example</u> and <u>Oracle SOA Suite 11g HL7 Inbound Example</u> – <u>Functional ACK Addendum</u> are built and deployed. It is assumed that data in the archive, HL7\_messages\_sources.zip, has been unpacked to C:\hl7\adt\data\. This archive is available from <u>http://blogs.czapski.id.au/wp-content/uploads/2010/06/HL7\_messages\_sources.zip</u>.

It is assumed that the free HL7 Browser tool, "HL7 Browser 1.0", available from the its author's page at <u>http://mac.softpedia.com/developer/Michael-Litherland-5914.html</u>, is available.

# HL7 v2 Receiver Solution

The solution we will be modifying is a HL7 Receiver, which will receive v2 delimited ADT A01 messages and will write them to files in the file system. This solution was discussed and built in the blog article <u>Oracle SOA Suite 11g HL7 Inbound Example – Functional ACK Addendum</u>.

The solution consists of a B2B Listener Channel, to which HL7 v2 ADT A01 messages will be sent (B2b Layer), and a SOA Composite which will receive these messages and will write them to a file in the file system (SOA Layer).



Messages in the sample message set use the following identifiers:

Sending Application	SystemA
Sending Facility	HosA
<b>Receiving Application</b>	PI
<b>Receiving Facility</b>	MDM

# **Data Analysis and Guideline Customization**

The Oracle B2B Document Editor includes Data Analysis instrumentation which allows analysis and validation of data using the Guideline (Message Structure). We will use this functionality to analyze the sample message and to customize the message structure so that it succeeds in validating our data.

Start the B2B Document Editor, which should be accessible through Start menu  $\rightarrow$  Programs  $\rightarrow$  Oracle as Oracle B2B.



Click Analyzer and locate the data file C:\hl7\adt\sources\ADT\_A01\_output\_1.hl7. Specify HL7 as data file type, then click Next.



Click Next to "Clean Up Data File".

Some	data hies may requir	e preprocessing. Please	e check this option to prepai	e the data for parsing
Sp	ecify either the Block	k Size or the Terminator sters which should be re	r from which to start the char emoved	acter removal process and
	Parameters: {Last	Used}	<b>V</b>	
	Block Size:	80	(excluding terminator)	Save As
	C Terminator Strin	. <b>.</b>	Hex:	
	Remove Chars:	{Non-AlphaNu 💌	Hex:	
Sa	ve processed file as	C:\hl7\adt\sources	ADT_A01_output_1.hl7.pro	cessed.dat

Click Next to "Data Structure".

🗟 Analyzer Wizard		×
Data Structure Please select node to link/validat	e	
EntireDocument	Data node name: EntireDocument Data node properties: FileName: 'C:\hl7\adt\sources\ADT_A01_output_1.hl7' TaskID: 'C:\hl7\adt\sources\ADT_A01_output_1.hl7' Data node links: Node start position = 0(0x0) Node size = 414(0x19e) Node end position = 414(0x19e)	A
	< Back Next > Cancel	Help

Make sure to select the "From Guideline File" radio button and locate the ADT\_A01.ecs guideline file, c:\h17\adt\_adt\_specs\adt\_a01.ecs, then click Next.

🗟 Analyzer Wiz	ard						×
<b>Guideline se</b> Please se	lection lect a guideline		/				J
A guideline from you can choos	m the Standards D e another guidelin	atabase is auto e from the data	matically matche base or a custom	d to the provide guideline file.	ed data file	e. However,	
Look in:	ADT_Specs	I FIOIT a gu	ildeline file	•	(÷ 🔁	<b>*</b> 🖩 🕈	
ADT_AD1.	ecs						
File name:	ADT_A01.ecs						
Files of type:	SpecBuilder file:	s (*.ecs)				•	
		< Back	Next >	Cancel		Help	

Accept default choice for "Envelope Segments" and click Next.

🗟 Analyzer Wizard	×
Envelope Segments Please specify Envelope Segments	
The selected guideline does not have Envelope Segments. To use Envelope Segments please select from following options:	
C Select Envelope Segments from the Standards Database	
Process without Envelope Segments	
O Use Envelope Segments from the external guideline file	
C Use Envelope Segments from multiple guideline files	
< Back Next > Cancel H	elp

Accept default for "Analyzer Mode and Outputs" and click Next.

🔯 Analyzer Wizard	×
Analyzer Mode and Outputs Please select analyzer modes and outputs to generate	
Analyzer Options Run Linker and Validator C Run Linker only Maximum number of errors to report: 100 Limit rejecting errors only	
Large data file mode	
Generate Logical Data Report Generate XData (XML): Never Files will be stored in the temp folder set in Tools->Options. They will be deleted when the application is closed. If you wish to save files, please do it prior to closing SpecBuilder.	
< Back Next > Cancel Help	

The data file will be analyzed and issues will be reported. The guideline structure appears in the top left hand side pane, the data file in the top right hand pane and the issues, if any, in the bottom pane.



Before going any further let's pull down the file menu and choose Save As to save a copy of the guideline. Let's name it ADT\_A01\_custom.ecs.

l	<b>A</b>	DT_A01.ecs - Orac	:le B2B - [H	L7-2.3.1]	
. [	Eile	e <u>E</u> dit <u>V</u> iew <u>T</u> ools	<u>W</u> indow <u>H</u>	jelp	
Ī		<u>N</u> ew	Ctrl+N	a 🖻 🗸 🗙 🌆 📴 💐 🆓 🖓 😫 🔛 🛛 🔯 🔯	3
ĥ	E	<u>O</u> pen	Ctrl+O	Data: C:\bl7\adt\so_\ADT_A01_output_1	l h
		Save	Ctrl+S		
	1	Save <u>A</u> s <del> –</del>			
		Save As Template.		The SustemA	
		Remove Template.		t 🕀 💼 HosA	
	4	Close		B C PI	
		Import		Complex Field 00007}	
		Export		2008090801529	
	-				
	_	Pu <u>b</u> lish to	· · ·	pair 🗈 💼 🖻 🖻 DT^A01	
	æ	Print	Ctrl+P	000000_CTLID_2008090801529	
Ш		Print Preview			
		Print Setup		⊡ <u>c</u> 2.3.1	

Let's double click on the first line in the Data Error View pane. The data type applicable to the error is selected in the guideline structure in the left hand side window. The data value itself is selected in the top right pane and the complete error message is shown in a dialogue box.



In this case the data value is incorrect – it is 13 characters in length where the specification expects it to be an even number of characters up to 14, followed by a period followed by up to 4 digits followed by a plus sign followed by further 4 digits – a standard timestamp format with optional trailing components. We have 13 characters in the value so the value is not valid.

We can do one of two things:

- 1. Modify the value by truncating a trailing digit (losing seconds precision) or appending a digit (perhaps add a trailing zero to increase precision of seconds)
- 2. Modify data type so that any string is accepted as valid

In the first instance we must consider whether the source system, from which this data is assume to have come, can be modified to send valid dates. If it can, then this would be a correct approach. If it cannot then we must modify the guideline to accept dates as given and then deal with the issue in the SOA layer. Let's assume we cannot modify the sending system and we must modify the data type.

As installed, the B2B Document Builder global property settings prevent modification of base components in guidelines; these are things like data types and lengths. To allow us to make necessary modifications we must change the relevant properties to relax the rules.

Click Tools  $\rightarrow$  Options. From the dropdown next to Common $\rightarrow$ Guideline View $\rightarrow$ Usage Restriction $\rightarrow$ Modification select All. Click OK to dismiss the dialogue box.



We are ready to modify the guideline structure to better fit our data.

In the Analyzer / Data pane click the parent node of the date/time value in error. Note in the left hand pane that the corresponding data structure node was selected. Click the Properties sub-tab immediately below the Analyzer / Data pane.



Properties of the node MSH-7 will replace the Analyzer / Data in the right hand pane.

Since we are going to change the data type associated with MSH-7 in this guideline click the ellipsis button to the right of the data type text box.

iuideline 🗦 4 🗮 🖷 💼	Field Propertie	5		¢	ategory   Re
Image: Second	E General ID: Name: Data Type: Requirement: User Option: Length:*	00007 Date/Time Of Message TS time stamp Optional Used 26	Position:	7] ] [1]	D Type Be
100012 12 Version ID     13 Sequence Number     14 Continuation Pointer     15 00015 15 Accept Acknowledgment Type     100015 15 Accept Acknowledgment T	Field	Purpose This field contains th sending system crea time zone is specifie the message as the	e date/time that the ted the message. If d, it will be used thro default time zone.	the =	(

When the dialogue box opens the TS (Time Stamp) data type is selected in the list at the left. Select ST (string) and click OK.

ata Types:						
PT processing type PTA Policy Type QIP query input parame QSC query selection cri RCD row column definil RFR reference range RI repeat interval RMC Room Coverage RP reference pointer SCV scheduling class v	ID: Name: Max Length: Purpose: String data is le (hexadecimal v except the defi Components:	ST string of 199 eft justifie values be ined deli	data d with trailing blanks tween 20 and 7E, ir miter characters. Exa	optional. Any displi clusive, or ASCII di mple:	ayable (printable) A scimal values betw	CSII characters een 32 and 126
SI structured numeric SPD Specially SPS specially SPS specimen source SI string data TM time TN time TN telephone number TQ timing quantity ST string stamp	Children TreeVie	ew	No children node.			

Note the change in the MSH-7 properties. Click the Analyzer / Data sub Tab to switch back to data view. We will analyze data again to see the effects of the change.

Field Propertie	25		Category Rese
🗆 General			
ID:	00007	Position:	7 🔊
Name:	Date/Time Of Message		
Data Type:	ST string data		Type Def.
Requirement:	Optional 💌	Repeats:*	1
User Option:	Used 💌		
Length:*	26		
Notes			
	Purpose		ABC.
Field	This field contains the dat sending system created the time zone is specified, it we the message as the defau	e/time that the he message. If will be used through the ult time zone.	the bughout

Click the Analyze button.

Data: C:\hl7\adt\so\ADT_A01_output_1.hl7	📲 🔯   🖬 🐉   💈	1 🔯
🖃 🧰 Message		
🛱 📴 MSH		
🕀 🚾 SystemA		
🕀 🔂 HosA		
🕀 🔂 PI		
🕀 📴 MDM		
🕀 🐻 (Complex Field 00007)		
2008090801529		
🕀 🔂 ADT^A01		
a 000000_CTLID_2008090801529		
🕀 🖻 P		
🕀 🔂 2.3.1		
- <b>E</b>		
- 💼 AL		
■ ■ N Properties 入User Notes 入Rules 入 Childre	en À Analyzer / Data /	

Click Next, Next, accepting defaults.

The MSH-7 data error is no longer there. The data type change caused the data present in MSH-7 to be considered valid. Let's inspect other errors. We notice two more errors of the same kind as the one we just addressed, error 2 and error 8.

Ds	John Error View					
=	ErrorID	Encr Message	Enor Data			
1	0+810028	The length of Field MSH10 (Message Control ID) is '26'. The maximum allowed length is '20'. Segment MSH is defined in the guideline	000000 CTLID 2008090801525			
2	0x9710004	Component EVN-2.1 (time of an event) has a data type of 'string data' (ST). The expected format was 'YYYY[MM[DD]/HHMM[SS],S[	2008090801529			
3	0x810028	The length of Field PID3 (Patient Identifier Lint) is '22'. The maximum allowed length is '20'. Segment PID is defined in the guideline	A000010"""HosA"MR"HosA			
4	0x810024	Field PV14 (Admission Type) does not contain a valid identification code: 1' is not allowed. Segment PV1 is defined in the guideline	1			
5	0x810062	Component PV17-14 [identifier type code] does not contain a valid identification code: "MAIN" is not allowed, Segment PV1 is define	MAIN			
8	0+810028	The length of Field PV119 (Visit Number) is '23'. The maximum allowed length is '20'. Segment PV1 is defined in the guideline at post	V2008090801529****VIS/T			
7	0x810062	Component PV1195 [identifier type code] does not contain a valid identification code. VISIT' is not allowed. Segment PV1 is define	VISIT			
8	0+9710004	Component PV1-44.1 (time of an event) has a data type of "string data" (ST). The expected format was "YYYY]MM[DD[HHMM[SS].S	2008090801529			

Let's repeat the steps to change data type of EVN-2 and PV1-44 from TS to ST. For each select the parent of the data item in error, click the Properties sub-tab, click the ellipsis to the right of the data type property, select ST (string) data type form the list and click OK.

Repeated analysis shows that the two more errors are resolved.

De	ta Error Vi	aw .	
	Error 1D	Encr Message	ExorData
1	0v810028	The length of Field MSH10 Message Control ID1 is '26'. The maximum allowed length is '20'. Segment MSH is defined in the guidely.	000000 CTUD 2008090801529
2	OvB1002B	The length of Field PID3 (Patient Identifier List) is '22'. The maximum allowed length is '20'. Segment PID is defined in the guideline	A000010 HosA MR HosA
3	0x810024	Field PV14 (Admission Type) does not contain a valid identification code. 1' is not allowed. Segment PV1 is defined in the guideline	1
4	0x810062	Component PV17-14 üdentifier type codel does not contain a valid identification code. 'MAIN' is not allowed. Segment PV1 is define.	MAIN
5	0+810028	The length of Field PV119 (Visit Number) is '23' The maximum allowed length is '20' Segment PV1 is defined in the guideline at posi-	V2006090601529****VISIT
6	0x81.0062	Component PV1195 (identifies type code) does not contain a valid identification code: VISIT' is not allowed. Segment PV1 is define	VISIT

Let's consider errors 1, 2 and 5. The message says something like:

The length of Field XXXNN (*description*) is 'NN'. The maximum allowed length is 'NN'. Segment XXX is defined in the guideline at position NNN.

This error was detected at: Segment Count: N Field Count: NN Characters: NN through NN

The data element is too long.

As before, we have two choices – fix the data of modify the guideline. We already decided that we can't fix the sending system so we can't fix the data. Since these are data lengths we must make judicious guesses on the maximum length of data we are likely to get for the specific fields. In this case we have fields MSH-10 (Max Length 20), PID-3 (Max Length 20) and PV1-19 (Max Length 20). Error messages say that data lengths are 26, 22 and 23 respectively. To sidestep the issue let's make all of them 40 characters in length.

Proceed as follows: Double-click error N message, dismiss the dialogue box, click the Properties sub-tab.



Change max length from 20 to 40. Repeat for the next error.

Field Propertie	5			Category Rese
🖯 General				
1D:	00010	Position:	10	2
Name:	Message Control ID			
Data Type:	ST string data			Ftype Def.
Requirement:	Required	Repeats:*	1	
User Option:	Must use	*		
Length:*	40			
ENotes				

Save the modified guideline and repeat analysis – click Analyzer / Data, click Analyze, click Next, click Next.

	33		
Data: C:\hl7\adt\so\ADT_	A01_output_1.hl7	12 🖄 ا	a 🗈   😫   🖸
🖃 🚋 Message			
	MDM 2008090801529  AD  avaCAPS6^^^^^USER9	T^A01 000000_ S	CTLID_200809080
⊡ 🔄 PID 1  A000010^^^HosA^M	R^HosA  Kessel^Abigai   19	46010112 <mark>3045  </mark>	M∥7 South 3rd Circl
🖻 🔄 PV1			

Three more errors are gone.

The first kind of errors we resolved was data format errors. The second kind of errors we resolved was data length errors. The errors we are left with are invalid value errors. Looking closely at the error messages leads us to believe that "T" is not a valid value for PV1-4, MAIN is not a valid value for PV1-7.14 and VISIT is not a valid value for PV1-19.5. The guideline and the analyzer together validate data against the list of values where lists of values are provided in the guideline.

Data Error Vie <del>w</del>						
	#	Error ID	Error Message	Error Data		
	1	0x810024	Field PV14 (Admission Type) does not contain a valid identification code: "I' is not allowed. Segment PV1 is defined in the guideline	T		
I	2	0x810062	Component PV17-14 (identifier type code) does not contain a valid identification code: "MAIN' is not allowed. Segment PV1 is define	MAIN		
I	3	0x810062	Component PV119-5 (identifier type code) does not contain a valid identification code: 'VISIT' is not allowed. Segment PV1 is define	VISIT		
I						

Click on the error 1 description, click on Properties sub-tab, expand PV1-4 node in the guideline tree in the left hand pane and select Admission Type component.

Guideline 🦿 4 🔹 💌	Codelist Pro	sperties (Total: 4, Included: 4, Excluded: 0)	
+ 1 00128 25 Birth Oxder	/ Value	Description	
00129 26 Olizenthip	U A	Actident.	
① 100130 27 Veteraris Military Status	ΘE	Evergency	
🗄 🚰 00739 28 Nationality	e1	Labor and Delivery	
3 2 00740 29 Patient Death Date and Time	₩ R	Routine	
O0741 30 Patient Death Indicator			
IN PUT UD4 PUT patient additional demogra			
PV1 006 PV1 - patient visit segment-	and the second second second		-
1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	Code Proper	lico	
① 00132 2 Patient Class	Code:	A	
0133 3Azigned Patient Localar	Have	Devident.	-
Can Coll 34 Admission Type		Proceeding a	_
To coded value for uter-delocatebles	True Man House		1
PT 00125 SPreaded Number	a contract of the second		
00136 6 Prior Palient Location	Description	Description:	
	User Note 2		
The second secon	User Note 3		
Guideline Gracionary	A A A A A A	Properties / User Notes / Rules / Children / Analyzer / Data /	
×1			
Dala Error View			
# Enor ID Enor Message		Eng	0×
1 0x810024 Field PV14 (Admission Type) does no	at contain a valid id	entilication code: If is not canved. Segment PV1 is defined in the guideline	
2 0x810052 Comparent PV17-14 Identitier type 1 3 0x810052 Comparent PV1195 Identitier type 1	code) does not carry	Jam a valid identification code: MAIN's not allowed Segment PVT is define. MAIN tim a valid identification code: MSIT's not allowed Segment PVT is define. VISIT	-
A ANNAL PROPERTY (1122) Instant (http://	sound when the con-	rest a construction of the state of the second of the seco	-

Note the top right pane displaying a code list, with all valid values. Here too we have a choice of fixing the source system or adding values to the list. We will add values to the list. Click the New Code button and add code "I" with name "Inpatient". Click Apply button.

Codelist Prope	Codelist Properties (Total: 5, Included: 5, Excluded: 0)					
🔺 Value	Description					
🛛 A	Accident					
🛛 E	Emergency					
• I	Inpatient					
€ L	Labor and Delivery					
🗳 R	Routine					
Code Propertie	\$ \$	🗅 🗙 🖱 🖬				
Code:		<b>^</b>				
Name:	Inpatient	4 4				

Repeat the process for PV1-7.14 adding MAIN to the code list.

Guideline 🗧 🗨	Codelist Pro	operties (Total	i; 38. included: 36. Excluded: 0j	
3 229 12 identifier check digt	Value	Description		
3 298 13 code identifying the check digk	• U	Unspecified		
😑 📷 252 14 identifier (ype code	# UPIN	Medicare/HC	FA's Universal Physician Identification numbers	
IS coded value for user defined tables	e vii	Visit number		
al factor science ope	e v5	VESA		
25 16 Name Reconcentation code	e wc	WIC identifie		
II a XDN extended composite name and identifical	• 33	Organization	identifier	
H = VPN extended person name	Code Prope	rlice		0×09
😑 😡 V2 3 1 ADT - ADT message (event AD1) 👘	Code:	MAIN		
H SH 001 MSH - message header segment H Ca 00007 1 Field Separator	Nané	Main		— T T
B      00002 2 Encoding Characters     B      00003 3 Sending Application	Tean New York	II	Ref = E + Z + Δ + H Z U   E	* =   E E @ @ <b>Q</b> # 3   *
B 00005 5Receiving Application	Description User Note 1		Description:	2
	User Note 2 Liser Note 3		1	
Colidetine 93 Dictionary	विश्वि	Properties (Us	ser Notes & Prules & Children & Analyzer / Data /	
Data Error View		presented       >         Description       >         MAIN       >         Properties          User Notes & Routes & Christen & Anatoser/ Data         Properties          Main          Main          Main          Main          Main          Main		
I Eror ID Enor Message				ExerData
1 Dx810024 Field PV14 (Admission T does n	iot contain a valid id	entilication code: 1	I' is not allowed. Segment PVT is defined in the guideline	L. I
2 Bdt10062 Component PV17-14 (deather type	codel does not cont	tain a vaid identify	cation code: "MAIN" is not aliceved. Segment PVT is define	MAN

Repeat the process for PV1-19.5 adding VISIT to the code list.



Click Analyzer / Data and repeat analysis.

Analyzer is happy. Save the modified guideline.

] 🖻 🚖 🖬 🛛 😂 🗍 🐰 🖻 🖻 🗸 🗡 🌋	B M D 3 4 11 1 1 2 2 2 3 6 7 5 5 4
Guideline 🔨 🔶 チ ↓ 🖛 ⇒ 💼	Data: C:\hl7\adt\so\ADT_A01_output_1.hl7 🛛 📸 📓 🔚
273 6 suffix (e.g., JR or III)     235 norefix (e.g., DR)     203 8 orgree (e.g., MD)     272 9 source table     281 10 assigning authority     272 11 name tune code	Image: Second Stress         Image: Second Stress           Image: Second Stress
Guideline Cictionary	Properties A User Notes A Rules A Children Analyzer / Da
🗴 Data Error Vie <del>w</del>	
# Error ID Error Message	
Analyzer with the 'Run Linker and Va	lidator' option tinished successfully, no errors were found during data validation.

Close the Data Analyzer window.

Back in B2B Document Editor click Open Document and locate the modified ADT\_A01\_modified.ecs guideline file.

🗳 Oracle B2B		
File Tools Window H	Help	
Oracle B2B	S	ORACLE <sup>®</sup> B2B Document Editor
	Open Look in:	ADT_Specs
	My Recent	ADT_A01.ecs     ADT_A01.xsd     ADT_A01_custom.ecs
Analyzer		ADT_ACK.ecs

Export the guideline to generate the XML Schema Document that corresponds to the modified guideline.

🗊 ADT_A01_custom.ecs - Oracle B2B	- [HL7-2.3.1]		
. <u>File E</u> dit <u>V</u> iew <u>T</u> ools <u>W</u> indow <u>H</u> elp .			
	<ul> <li>× &lt; </li> </ul>	3 M I 🖸 I 🕯	፤ ‰ 💣 🖹 🔡 🔯
Save Ctrl+5	E	Message Prop	erties
Save As	egment	⊡ General	
Remove Temp <u>l</u> ate	ht hisegme	ID:	ADT
Close	emogra	Name:	ADT message
	iated pa	Event:	A01
Import	pnal infc	Event Name:	ADT/ACK - Admit / visit n
		Standard:	HL7
Pu <u>b</u> lish to	segmer     setion s	Notes	

As before, choose Oracle B2B and click Next.

Export Wizard	······································	×
	Welcome to Export Wizard	
	This wizard helps you convert a SpecBuilder guideline into external formats for use with other applications.	
EXPORT	Choose an export to perform:	
	Comma Separated Values format (CSV) gXML v1.0 Oracle B2B, 2.0	
	Description:	
	This export routine will convert the guideline from the internal format to one that can be used with the Oracle B2B runtime software 2.0.	
	< Back Next > Cancel Help	

Specify C:\hl7\adt\ADT\_Specs\ADT\_A01\_custom.xsd as the XML Schema Document's name and location, then click Next and Finish.

· · · · · · · · ·		
Export	Wizard	×
Exp	port Export destination	s),
S	ave exported File as:	
	C:\hl7\adt\ADT_Specs\ADT_A01_custom.xsd	
	Save guideline before exporting	
Γ	Show advanced options	
l		
:		
	< Back Next > Cancel	Help

Close the B2B Document Editor. We are done with it.

We exported the customized HL7 v2 ADT A01 definition in the XML Schema form which would be used in the SAO Layer.

## **Modify Document Definition in B2B**

Start the B2B Trading Partner Manager console by pointing the web browser at <u>http://localhost:7001/b2b</u>. Log in as weblogic/welcome1.



Click the Administration link, click the Document Tab, expand HL7 node tree all the way to ADT\_A01\_DocDef. Click ADT\_A01\_DocDef and update document definition and transaction set files. Click Save to save changes.



Save and deploy all Trading Partner Agreements which use the modified document definition. If you followed all articles so far these will be HL7ReceiverOuboundTPA\_Agr outbound agreement and HL7ReceiverTPA\_Agr inbound agreement.

🗄 Partner 🛛 🔶 🗮 🖉 🖉	Agreement	
Local-IL/Receiver	Arta HL7ReceiverTPA_Agr	ADT JO Coulor Renated Tender
	*Apremential (K. NecovertPA) Teams (C. Statementing, Spr. 2) Description	epoynent Successful
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Note, in the screenshot above, that the Validate property on the inbound agreement is checked. The message will be validated against the agreement. If what we did so far works, the message, which in previous articles failed to validate, will now be accepted as valid.

# **File Writer Solution**

We modified the guideline file and the resulting XML Schema Document is different. The differences are in restrictions and value lists, not in structure. We expect that unless the B2B Adapter or the Mediator performs schema validation on incoming data the differences will not be significant and the file writer solution will work without changes.

# **Exercise HL7 Inbound solution**

Start the B2B Trading Partner Manager Web Console, <u>http://localhost:7001/b2b</u>, log in and click the Reports link. Note that there are no messages shown. No messages have been received yet.

Open a command window and run the HL7Browser:

C:\jdk1.6.0\_20\bin\java.exe -jar C:\tools\Hl7Browser.1.0\HL7Browser.jar

When the UI appears click the "Open an HL7 File" button, locate the ADT A01 transaction file, C: $h17\adt\sources\ ADT_A0x\_output1.h17$ , and open it.

	·				
🛓 HL7Browser - 1.0	adt\data\sources\ AD	T_A0x_output1.	.dat		
File					
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Look in	: 🛅 sources		•	🤌 📂 🛄 📰	
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My Recent	ADT_A01_output_2	.hl7	ADT_A03_output_	1.hl7_copy_up.cma	i 🗟 ADT_AC
Documents	ADT_A01_output_2	.×ml	ADT_A03_output_	1.×ml	adt_ac
	ADT_A01_output_2	6.hl7	ADT_A03_output_	1.zip	adt_ac
	ADT_A01_output_2	6.×ml	aDT_A03_output_	25.hl7	adt_ac
Desktop	ADT_A01_output_5	.hl7	ADT_A03_output_	_25.×ml	adt_ac
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	aDT_A01_output_5	0.hl7	ADT_A03_output_	49.×ml	📷 ADT_AC
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My Network					
Places	Files of type: All Files			<b>–</b>	Cancel

Click "Run the network utility" button, provide localhost as the Host and 12121 as the Port (recall this is the port on which the B2B listener is listening) and click Connect.

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File Help	
HI7 Records	1 :
	22
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• 9V1 1 I  I  FUL^Fulde~Gordian^^^^^MAIN   EMR     V2008090801529^^^^VISIT	4,303
	42,273
	- D ×
File	Help
Send Mode   Device Mode	· · ·
Perena Manual Manu	
Host: localhost Port: 12121	Connect
	6
Start: 1 Stop: 1 Stop: 1	Messages

Once connected, click the "Send Messages" button.

Observe message exchange. The message was sent and the ACK received.

	المعالم	_ 🗆 🗵
	File	Help
1	Send Mode Receive Mode	
:	Host: Port: 12121	Disconnect
	Start: 1 Stop: 1 Stop: 1 Stop: 1	Send Messages
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The message was valid.

Let's modify the message so that it originates from SystemX HosX, rather than SystemA HosA as expected. Disconnect, re-connect and send the message again.

<ul> <li>9 3: SystemX</li> <li>4: HosX</li> </ul>	18.7Browser - 1.0		
• 5: PI	tie		
- • 6: HDH	Send Mode Receive Mode		
• 5: 200809080	Host	Partsiiiii	🚫 Dec
• 10: 000000_0 • 11: P	🕜 Start	Stop	🖓 Send All? 🚮 Send Has
• 12: 2.3.1 • 15: AL	Starting et: 10:28:15		
• 16; NE	10:28:15 sending: MSH[^~/)8(5ysten00H	los0[P1]M0M[200609001529][ADT~A01[00000_CTLID_2000	0090601529(P[2.3.1]) [ALINEEVN[A01]2008090801529]

Message has been rejected -MSA-2 == AR.

Let's restore the message sender to the original SystemA HosA but change the PID segment ID to PIX. Disconnect, connect and Send Message again.

- de Honi	HL7Browser - 1.0		1012
- + 5: PI	Pile		Pair (
• 6: 1D/1	Send Mode Receive Mode		
<ul> <li>7: 200809080</li> <li>9: ADT^A01</li> <li>10: 000000 5</li> </ul>	Host	Port	Deconnect
● 10: 00000_C ● 11: P ● 12: 2.3.1	2ati	Stop:	Send All? 🚺 Send Message
<ul> <li>11: P</li> <li>12: 2,3,1</li> <li>15: AL</li> <li>16: ME</li> <li>FUNIA01/200809C</li> <li>PIX(1) IA000010<sup>4</sup></li> <li>PV1111111111FC</li> </ul>	Starting at: 10:30:43 10:30:43 sending: NSH (**/b) SystemAlt aCAPS6 0023**43()))))) AZDSRSPD01 ()AZDSRSPD1 ()AZDSR	eeA/P[/MCM[2000090001529][AD1~A01[00000T1LD_20000 0~~~HosA*9P~HosA[Kessel~Abgel][19460101123045[M[]]7 [[]][[PLL~Fulde*Gadder ~~~SystemA~~]eosA~~[20100626~[[ACK^A01][1018]P~[2.1 urd in the data file. The last~PD*3~100630-81004d rejectivi	79001529[PI2.3.1][[A][M2YN[A0][2008090001529][[Lev 7 South Srd Gride***Downham Market*England - Norfolk**3 South Srd Gride************************************

This time we have MSA-2 == AE, Application Error. Message was rejected for structural reasons "ERR|^^^100&0x810070:Rejecting:Unrecognized data was found in the data file. The last~PID^3^100&0x81004d:Rejecting:Segment PID (PID - patient identification segment)".

#### Valid and Erroneous Message Tracking

Start the B2B Trading Partner Manager Web Console, <u>http://localhost:7001:b2b</u>, Click Reports Tab and click Search.

Business Message		
d Search		Advanced
Inti C al C any Sector Contain 2 Recover Contains 2 Agreement Contains 2	Receive Two Many Scenter Tran	10: (UTC + 10:00) Sydnes, Cardianne X
end Time Stano   Greate Than 💽 (36/19/3010 12/00/00 44 🖏 5,mC+35:00) Sydney, Cardiana		Search Reast Serve.,

We see 6 Business Messages. One for each message we sent – one valid two invalid, and one each for the acknowledgments to each message.

Busie	ness Hessag	R WYE Messay	e Application Message	Enw Conversation			
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and an end					available to referred the		100/01/00/y, JUNE 20, 20/00 20:00/111
2	94a	MSG_ERROR	ADT_A01	HL ReceiverTPA_Agr	Renote+L7Sender L	ocalHL 7Receiver	Saturday, June 26, 2010 10:30:
2 3	961 961	MSG_ERROR MSG_COMPL	ADT_A01 ACK_A01	HL TReceiverTPA_Agr HL TReceiverTPA_AOX_Agr	RemoteHL7Sender LL LocaHL7Receiver R	ocaHL /Receiver emotaHL 75ender	Saturday, June 26, 2010 10:30: Saturday, June 26, 2010 10:30: Saturday, June 26, 2010 10:28:
2 3 4	相助	MSG_ERROR MSG_COMPL MSG_ERROR	ADT_A01 ACK_A01 ADT_A01	HL/Receiver/TPA_Agr HL/Receiver/TPA_ACK_Agr HL/Receiver/TPA_Agr	RenoteHL7Sender LL LocaHL7Sender R RenoteHL7Sender LL	ocaHL 7Receiver emotoHL 7Sender ocaHL 7Receiver	Saturday, June 26, 2010 10:30 Saturday, June 26, 2010 10:30 Saturday, June 26, 2010 10:28 Saturday, June 26, 2010 10:28
2 3 4 5	ももも	MSG_BRROR MSG_COMPL MSG_BRROR MSG_COMPL	ADT_A01 ACK_A01 ADT_A01 ACK_A01	HL TReceiver TPA_Agr HL TReceiver TPA_AOX_Agr HL TReceiver TPA_Agr HL TReceiver TPA_ACX_Agr	RenoteHL7Sender LL Local+L7Receiver R RemoteHL7Sender LL Local+L7Receiver R	ocalHL 7Receiver enoteHL 7Sender ocalHL 7Receiver emoteHL 7Sender	Saturday, June 26, 2010 10:301 Saturday, June 26, 2010 10:301 Saturday, June 26, 2010 10:281 Saturday, June 26, 2010 10:281 Saturday, June 26, 2010 10:251

19

In the Error tab we see two messages with error text shown.

BB	ror Mess	age						
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Field	C.R.G	E ANY						
	±ror (	Code Contains	E line	Text Contains				
	Error I	and Contains	E Druz Deut	Contains				
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							Beardh Rese	1 Styten
Resu	it (Messa	ge Count: 2	)			lotby: Charter	Date Ditter	Descanding
	Details	Errar Code	Error Description	Broriele	Error Severity	Error Test	10.00	1.4
1	94 14	628-51507	Machine 3/No (quarteb/2b) Unrecognized data was found in the data file. The last inclusion of the part	IN SEG BERGE LEVEL COLLABORATIN	ON ERROR	Validator ervor -	Extra data was enco	untered. A.d.,

Clicking Details button for one of the messages allows us to drill down into details of the error, then drill further into payload and wire message.

Business Message		
conclation non na autoria		
Correlation From XPath	2	
Expression		
Correlation To XPath Name		
Correlation To XPath Value		
Correlation To XPath Expression		
Wire Message	Wire Message	
Application Message	Application Message	
Payload Storage	Payload Storage	
Attachment	Attachment	
Label	soa_b2b Sat Jun 26 10:16:20 EST 2010	
Collaboration Id	C0A8A48112971A79D9900000F3AEE500	
Collabration Name		
Collabration Version		
Business Action Name		
Exchange Protocol Name	MLLP	
Exchange Protocol Version	1.0	
Interchange Control Number		
Group Control Number		
Transaction Set Control Number	000000_CTLID_2008090801529	
Error Code	B2B-51512	
Error Description	Machine Info: (xponeb2b) Validation of Message header parameters failed. Please verify all the Message header parameters in the B2B configuration match the Message header parameters in the message. Following parameters are not matching with the configured parameters in B2B. key = [MessageSendingFacility] value = [HosX] param = [HosA] key = [MessageSendingApp] value = [SystemX] param = [SystemA]	
Error Level	ERROR_LEVEL_COLLABORATION	
Error Severity	ERROR	
Error Text	Validation of Message header parameters failed.	<b>-</b>
	<u> </u>	
	OK	

Clicking Application Message Tab shows only valid messages. There is only one in this exercise.

Applicat	tion Me	ssage												
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Wire Message Tab shows message State, Protocol and End-point URL at a glance.

Business Messa	Wire Hessage Are	kaller Meslage Eine Conversation		
Wire Me	ssage			
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Match C / Trave	al G Any UI Contains port Protocol Contains State (Contains )		Cheened Date Greater Then 🗶 04/26/2 Mossage Id Contains 💌	סום 12:00:00 44 אין אין דער +10:00) Sydney, Carberns Saarth Raset
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Deta	COMPLETE	Transport Protocol TCP	TOPut/locathosts (2)(2)	Destending Created Date Coder Destending Destending Seturities, Sure 26, 20:37 10:30:44 444 GMT+10:00
Deta IIII IIII	E State COMPLETE ERROR	Transport Protocol TCP TCP	148 TCP:(Jocabost; 12121 TCP:(J127.0.0.1:12121	Dort Dy Orestel Cate Colley Descending Created Date Seturitiev, June 24, 2020 10:30-44 AM GMT + 10:00 Seturitiev, June 24, 2020 10:30-45 AM GMT + 10:00
Deta H Deta	COMPLETE ESRICE COMPLETE	Transport Protocol TCP TCP TCP	UH TOP (Jlocathoet; 12121 TOP (Jlocathoet; 12121 TOP (Jlocathoet; 12121	Desited Date Created Date Creater (Descending Desited Date Seturday, June 36, 2030 10:30-44 AM GMT+10:00 Seturday, June 26, 2030 10:30-43 AM GMT+10:00 Seturday, June 26, 2030 10:38:39 AM GMT+10:00
Deta 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	State COMPLETE ESR.CR COMPLETE ESR.CR	Transport Protocol TCP TCP TCP TCP	UH TOP (Jbcahostr) (212) TOP (J1274)6.0. (1212) TOP (Jbcahost) (212) TOP (J1274)6.0. (1212)	Birrthy Created Date Creater Date Descending Creater Date Creater Date Statutory, June 26, 2013 10:00-44 AM GMT+15:00 Saturday, June 26, 2013 10:00-43 AM GMT+15:00 Saturday, June 26, 2013 10:00 13:34 M GMT+15:00 Saturday, June 26, 2013 10:00 13:34 M GMT+15:00 Saturday, June 26, 2013 10:00 10:21:35 AM GMT+15:00 Saturday, June 26, 2013 10:20:31:35 AM GMT+15:00 Saturday, June 26, 2013 10:21:35 AM GMT+15:00 Saturday, June 26, 2013 10:20:35 AM GMT+15:00 Saturday, June 26, 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2014 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2015 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2015 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10:20; 2013 10; 20
Dela Hill Hill Hill Hill Hill Hill Hill Hi	State     COMPLETE     SSRCR     COMPLETE     SSRCR     COMPLETE     SSRCR     COMPLETE	Tramport Protocol TCP TCP TCP TCP TCP	104 TOP ((locafront) (2121) TOP ((locafront) (2121) TOP ((locafront) (2121) TOP ((locafront) (2121) TOP ((locafront) (2121)	Information Content Date Content Descending - Created Date Statution, June 26, 2030 10:00-44 AM GMT + 10:00 Saturday, June 28, 2030 10:00-45 AM GMT + 10:00 Saturday, June 28, 2030 10:20:15 AM GMT + 10:00 Saturday, June 28, 2030 10:21:15 AM GMT + 10:00 Saturday, June 28, 2030 10:22:10 AM GMT + 10:00

Metrics link shows a dashboard with graphs showing message errors, completions and processing times, tabulated view of messaging and tabulated summary of errors. The screen capture does not give justice to the display.

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This concludes the exercise.

### Summary

Oracle SOA Suite B2B component can be used to provide HL7 v2 messaging support for healthcare environments.

In this article we created a customized HL7 v2 ADT A01 structure which allowed us to successfully validate incoming messages. We modified the document definition and the Partnership Agreements to use the custom structure and validate messages as they came in.

The customization we discussed here only scratches the surface of what is possible with the Oracle B2B Document Editor.

#### References

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